

Monitoring for Radioactivity in Imported Scrap Metal

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There is concern that imported scrap metal may contain radioactive sources or materials. If it does, it can have major health, environmental, and economic impacts. If undetected, the contaminated metal can enter into the steel-processing cycle, contaminating the mill, and potentially be incorporated into consumer products, resulting in the possibility of harmful exposure incidents and significant economic impacts to the steel industry. If undiscovered, the sources could become mixed with scrap that is being refined for steel production.

Radiation detection systems are routinely installed at scrap-processing facilities and steel mills in efforts to detect the presence of radioactive material and prevent an accidental melting. Grapple-mounted detection systems offer the opportunity to monitor bulk scrap shipments directly during the off-loading process at the port. The configuration and orientation of the detection system decreases the sampling volume and increases the probability of detecting a source of contamination. The Bureau of Customs and Border Protection initiated and funded this project to use the Environmental Protection Agency's (U.S. EPA) expertise to monitor imports for contamination.

By the end of 2004, ORIA had completed two pilot projects, through a voluntary effort with industry, to monitor for the presence of radioactive sources in imported scrap metal arriving at Darrow, LA, and Charleston, SC. A plastic scintillation detector was attached to the grapple used to extract scrap from the hold of a ship. The detector transmitted radioactivity level data to a computer for automatic logging at specific time intervals. An alarm system was also in place to alert workers about the discovery of radioactivity.

Through partnerships with the stevedoring firm and the mill receiving the scrap, the stevedores unloading the scrap metal initiated the monitoring process. The ORIA/RPD also partnered and collaborated with the U.S. EPA's National Air and Radiation Environmental Lab (NAREL) for expertise in detecting radioactivity and data logging, U.S. EPA Regions 4 and 6 to provide training and oversight of the project with assistance from a contractor; the Bureau of Customs and Border Protection, and the states of Louisiana and South Carolina for emergency response. All partners participated in the development and approval of operation and response protocols.

The pilots demonstrated:

- Industry can operate and independently maintain the operation and response protocols developed during the project, and they do not interfere with commerce.
- Full technical analysis and validation of the detection system.
- Private sector and federal and state agencies can cooperate successfully.

Pilot results also illuminated the need for continued monitoring practices at ports that import as well as export scrap. Next steps include exploring expansion of monitoring to major ports in a best practice standard through voluntary participation with industry.